DISTRIBUTION OF THE SHOSHONE SCULPIN (*COTTUS GREENEI*: COTTIDAE) IN THE HAGERMAN VALLEY OF SOUTH CENTRAL IDAHO

Richard L. Wallace[1], J. S. Griffith, Jr.[2], D. M. Daley[2], Patrick J. Connolly[1] and G. B. Beckham[2]

Abstract.— *Cottus greenei*, a potentially threatened species endemic to Idaho, was collected from 49 localities in 25 springs/streams in south central Idaho. Most localities were along the north bank of the Snake River in waters of the Thousand Springs formation, Gooding County. One population was found in a spring in the main Snake River. Another sculpin, *Cottus bairdi*, was collected with *C. greenei* at 23 locations in 16 springs/streams. Confusion concerning the type locality of *Cottus greenei* is discussed.

The Shoshone sculpin, *Cottus greenei* (Gilbert and Culver 1898), has the most restricted distribution of any native fish in Idaho except the endemic fishes of Bear Lake. Until recently, the species was known to occur only in three streams (Riley, Sand Springs, and Billingsley creeks) in the Thousand Springs area of the Hagerman Valley of south central Idaho (Simpson and Wallace 1978). Wallace (1980) reported *Cottus greenei* from one additional stream in the area and noted the possibility of its occurrence in the main Snake River. The U.S. Fish and Wildlife Service initiated a status review of *C. greenei* in 1980 because of its restricted distribution and impending development of waters in the area. By that time, the species was known to occur in at least 10 streams and springs in the Thousand Springs formation (Williams 1980). During 1981 we made over 130 collections from about 100 localities in the area to define the distribution of the Shoshone sculpin more clearly. This report on the distribution of *Cottus greenei* is a segment of a larger study to determine the distribution, abundance, habitat preferences, and life history of this potentially threatened fish species in Idaho. Specific locations of all populations of *Cottus greenei* collected by us and sampling sites where *C. greenei* were not found are on file at the University of Idaho and Idaho State University.

Taxonomy and Type Locality

The Shoshone sculpin was named and described as *Uranidea greenei* by Gilbert and Culver (1898:1965). *Uranidea* was later synonymized with *Cottus* (Jordan et al. 1930). There has been some confusion concerning the location of the type locality of *C. greenei*. The original description was based on specimens collected in 1894 (Jordan and Evermann 1898). The type locality was listed as "Thousand Springs, Snake River, Idaho, near mouth of Salmon Fall River." Salmon Fall River (now referred to as Salmon Falls Creek) enters the Snake River from the south, nearly opposite Thousand Springs. Thus, Salmon Falls Creek might be considered the type locality. The expedition on which the type of *C. greenei* was collected was different from that reported by Gilbert and Evermann (1894) (Robert R. Miller, pers. comm.). Therefore, the type locality of *Cottus greenei* is Thousand Springs, Gooding County, Idaho, and not Salmon Falls Creek, Twin Falls County.

One specimen of *Cottus greenei* housed in the fish collection of the Museum of Zoology, University of Michigan (UMMZ 157055) is labeled as being collected from Salmon Falls Creek in 1948 by James Simpson of the Idaho Department of Fish and Game. Mr. Simpson told us he never found *C. greenei* on the

[1]Department of Biological Sciences, University of Idaho, Moscow, Idaho 83843.
[2]Department of Biology, Idaho State University, Pocatello, Idaho 83209.

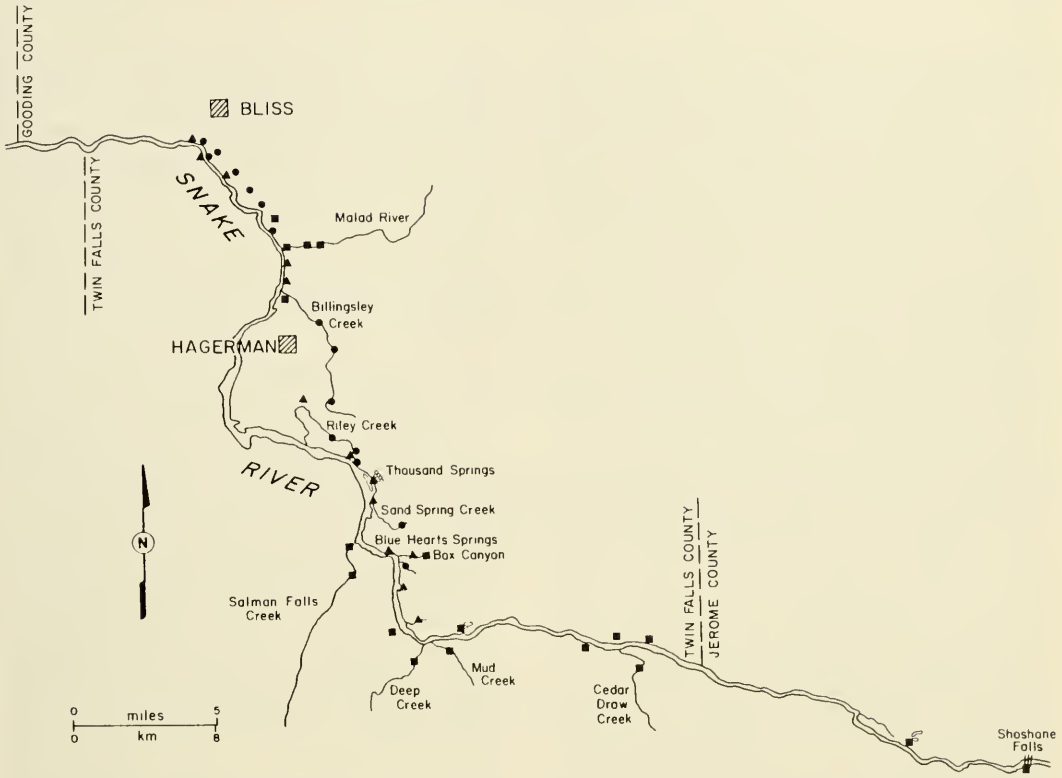

Fig. 1. Distribution of Shoshone sculpin (*Cottus greenei*) and mottled sculpin (*C. bairdi*) in the Hagerman Valley area of south central Idaho. Not all localities are shown.

south side of the Snake River and does not remember ever collecting it in Salmon Falls Creek (James Simpson, pers. comm.). This same information was transmitted to R. M. Bailey when Simpson's Idaho fish collections were sent to Michigan in April 1948 (Robert R. Miller, pers. comm.). We made three separate collections in lower Salmon Falls Creek, one very near the place where Mr. Simpson collected in 1948, and found only *Cottus bairdi*. Therefore, we believe that the locality data on that specimen, UMMZ 157055, are incorrect and that *Cottus greenei* does not occur in Salmon Falls Creek.

Methods

We used D.C. and A.C. electrofishing gear and dip nets to collect sculpins from most localities. Scuba surveys were made in deep pools of tributary streams and in areas of the main Snake River. Divers collected sculpin with hand-operated slurp guns. When possible, sculpin were identified and released at the place of capture. Some samples were preserved in 10% formalin to fulfill other objectives of the study. All preserved specimens will be retained in the fish collections at the University of Idaho and Idaho State University.

Results and Discussion

Cottus greenei was found at 49 locations in 25 springs/streams in the Hagerman Valley (Fig. 1). With two exceptions, *C. greenei* occurred only in Gooding County. Most sites were within the Thousand Springs formation along the north bank of the Snake River between River Miles (RM) 565.8 and 590.5. We found only two localities containing *C. greenei* on the south side of the Snake River in Twin Falls County. An unnamed spring flowing into the Snake River at RM 566.6 contained a very small population of Shoshone sculpin. At RM 588.3, a few *C. greenei* were found in the outflow from the private fish hatchery. Their water supply is collected from Box Canyon Springs, immediately across the Snake River, and piped to the

south bank where the hatchery is located. Apparently, some individual sculpin have been transported across the Snake River with the water that is diverted to this hatchery. The most upstream collection came from Briggs Springs at RM 590.5. There are many additional springs entering the Snake River above this site, but intensive sampling and an analysis of existing collections of sculpins from these areas revealed only the mottled sculpin, *Cottus bairdi*.

The mottled sculpin was found throughout the area and was the only species of sculpin found in the streams entering the Snake River from the south. *C. bairdi* was found sympatrically with *C. greenei* at 23 localities in 16 streams/springs in the area. Other fish species collected in the area included rainbow trout (*Salmo gairdneri*), brown trout (*Salmo trutta*), longnose dace (*Rhinichthys cataractae*), speckled dace (*R. osculus*), northern squawfish (*Ptychocheilus oregonensis*), redside shiner (*Richardsonius balteatus*), chiselmouth (*Acrocheilus alutaceus*), peamouth chub (*Mylocheilus caurinus*), largescale sucker (*Catostomus macrocheilus*), largemouth bass (*Micropterus salmoides*), and bluegill (*Lepomis macrochirus*). Rainbow trout, brown trout, longnose dace, and mottled sculpin were found sympatrically with the shoshone sculpin except at two localities. At Blue Hearts Springs in the Snake River, redside shiners, largescale suckers, and largemouth bass were also collected. Redside shiners were collected with *C. greenei* in Upper Sand Springs Creek. *C. greenei* was not found in the Malad River (four sampling locations), Salmon Falls Creek (three sites), or Deep, Mud, and Cedar Draw creeks.

Most locations sampled apparently contain small populations of *C. greenei*, perhaps only a few dozen to a few hundred individuals. At least three sites, however, support populations of thousands of Shoshone sculpin. Two of these sites, Box Canyon and Blue Hearts Springs, are entirely or partially on public lands administered by the Bureau of Land Management. The third site, Sand Springs Creek, is under private ownership, as are most of the springs supporting smaller populations of *C. greenei*. Riley creek, a stream containing a fairly large population of *C. greenei*, flows through state and federal fish cultural stations and a state wildlife management area. Most populations in this stream, however, are located in the various springs feeding the creek and in the hatchery raceways. We found no *C. greenei* in Riley Creek below the wildlife management area.

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